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ABSTRACT

These proceedings contain presentations (speeches, discussions, papers) from a conference on how office automation is affecting the work lives and employment future of clerical workers. They include a "Welcome to the [National] Academy [of Sciences]" (Roslyn Feldberg), "Opening Remarks" (Lenora Cole Alexander), and "Goals and Objectives" (Mary Murphree). Remarks of panelists are then provided from a roundtable on "Defining the Issues": "Employment Prospects" (Carol Jusenius Romero); "Quality of Jobs" (Bonnie M. Johnson); "Pay Equity and Career Opportunity" (Judith Gregory); "Training and Retraining" (Joyce Dudley); "Employment Discrimination in Today's and Tomorrow's Economy" (Thierry Noyelle); "Working Conditions: Health, Safety, and Stress" (Barbara Cohen); and "Women and Home-Based Work" (Kathleen Christensen). Excerpted remarks and quoted comments from a group discussion are followed by "Introduction of Keynote Speaker" (Clinton M. Wright) and the keynote speech, "Office Automation: A Brief History of Thought" (Eleanor Wynn). Suggestions for research are consolidated in the concluding section, Research Recommendations. These include three workshop reports--"Macro-Level Research on Clerical Employment Issues," "Micro-Level Research on Clerical Work," and "Identifying Issues for Experimental Programs"--as well as the research ideas offered by speakers in their remarks. (YLB)

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Women, Clerical Work, And Office Automation: Issues for Research

Report of a Conference
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U.S. Department of Labor
Office of the Secretary
Women's Bureau

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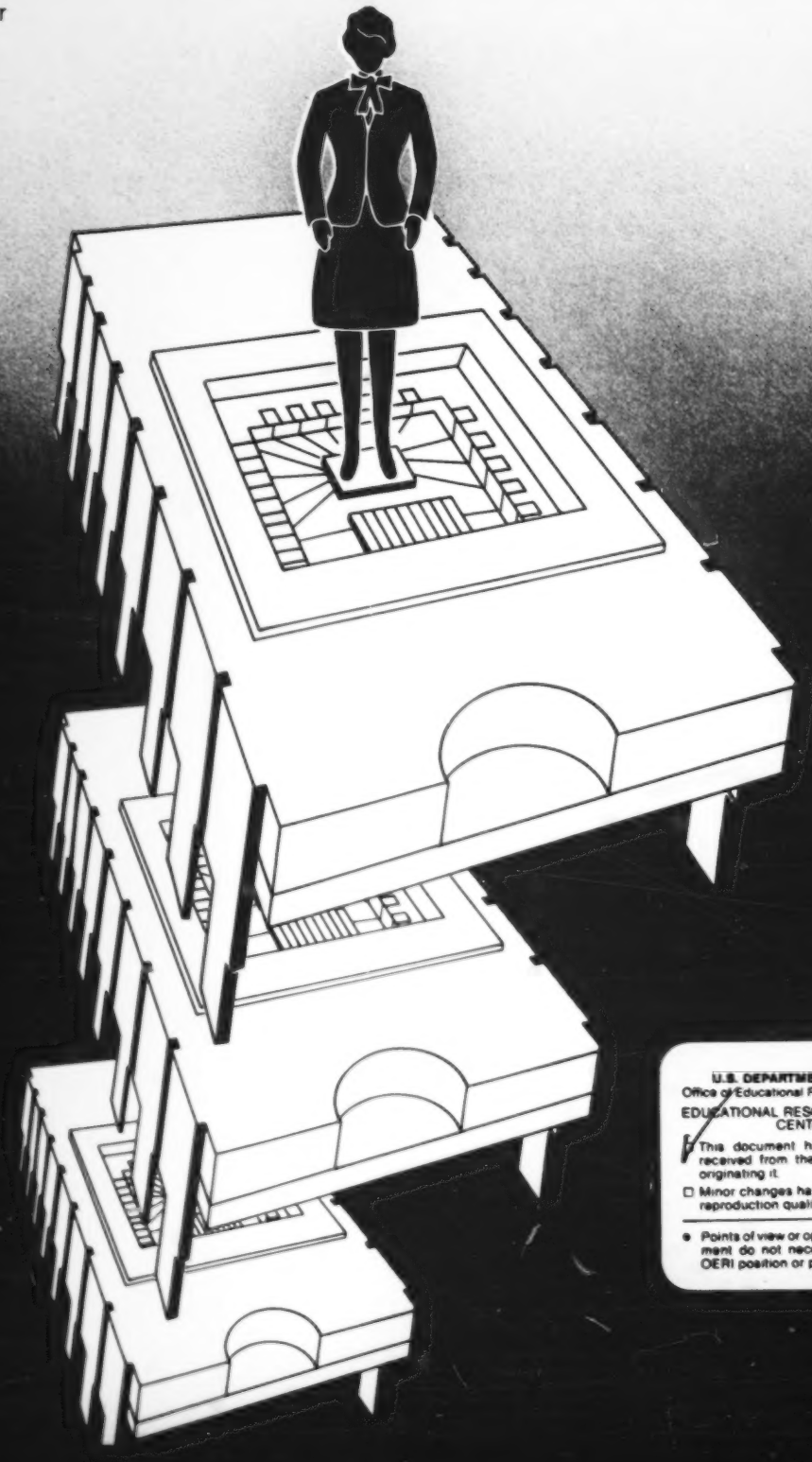

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Women, Clerical Work, And Office Automation: Issues for Research

Report of a Conference
Sponsored by the Women's Bureau in cooperation with
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U.S. Department of Labor
Wiliam E. Brock, Secretary

Women's Bureau
Jill Houghton Emery, Acting Director

1986

FOREWORD

The Women's Bureau is pleased to have sponsored, along with the Panel on Technology and Women's Employment of the National Research Council/National Academy of Sciences, a conference to identify research needs related to the impact of automation on clerical workers. The cooperative effort demonstrates a partnership approach to exploring employment opportunities as well as any problems resulting from technology in the workplace. We now share with the public the proceedings of that conference which brought together a number of persons with expertise on employment and training issues that affect workers directly and ultimately our U.S. economy as well as the competitive world market.

The need for continuing research to document the effects of technological change on office workers, most of whom are women, is of particular interest to the Women's Bureau in terms of both formulating effective policies and developing experimental programs. The conference was a significant step in that direction and elicited information for launching further initiatives.

Jill Houghton Emery

JILL HOUGHTON EMERY
Acting Director, Women's Bureau

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OVERVIEW

The 1-day conference on how office automation is affecting the work lives and employment future of clerical workers was sponsored by the Women's Bureau of the U.S. Department of Labor in cooperation with the Panel on Technology and Women's Employment of the National Research Council/National Academy of Sciences. It was held at the Academy in Washington, D.C., on October 19, 1984. About 75 people were invited to participate; they represented government, private industry, unions, educational institutions, and other segments interested in the subject of technological change and its impact on the workplace.

To capture the mood of the conference as well as the similar and diverse views expressed by participants, virtually all of this report is presented in the format of excerpted remarks and quoted comments. The remarks of panelists as well as the discussions which took place in a plenary session and in workshops highlight salient issues related to women clerical workers and office automation. They convey findings of research, identify key issues in need of research, and share perceptions of the experts.

Suggestions for research, including experimental programs, are consolidated in the concluding section, "Research Recommendations." These include the workshop reports as well as the research ideas offered by speakers in their remarks. Additional research-related concerns of participants are summarized under "comments."

Appendixes include the conference agenda and a list of the participants.

WELCOME TO THE ACADEMY

Roslyn Feldberg, Ph.D., Conference Chair
Panel on Technology and Women's Employment
Committee on Women's Employment and Related Social Issues
Commission on Behavioral and Social Sciences and Education
National Research Council
Murray Research Center, Radcliffe College

> "The Panel is engaged in a 2-year study of the implications of technological change for women's employment, and is focusing particularly on office automation and information technologies."

On behalf of the Panel on Technology and Women's Employment, of which I am a member, I welcome you to the National Academy of Sciences and to this conference.

The Panel on Technology and Women's Employment operates under the aegis of its parent committee, the Committee on Women's Employment and Related Social Issues. This committee exists, as the other Research Council committees do, to bridge the gap between scientific research and public policy. The mandate of the committee is to introduce the results of research into the policymaking process, and it does so by carrying out studies which are sponsored by various government agencies.

The Panel is engaged in a 2-year study of the implications of technological change for women's employment, and is focusing particularly on office automation and information technologies. We are looking at overall impacts of these changes, as well as trying to be sensitive to the differences between large factory offices and smaller, more individual offices. The study is funded jointly by the Academy and the Women's Bureau. Therefore, the cooperative efforts of putting on this conference with the Women's Bureau is a wonderful opportunity to convene a whole community of researchers and others who are interested in the topic.

Today we will be asking questions to find out what we already know on the topic from existing research, what we need to know, and what kinds of research would be useful to answer the critical questions that are outstanding. We will take the results of this conference back to our Panel, and we hope it will help us in completing our study.

OPENING REMARKS

Lenora Cole Alexander, Ph.D.
Director, Women's Bureau

> "The Bureau has been keeping a careful eye on the formidable progression of the computer-based technologies that have been descending upon the American workplace, and we have become concerned about the way they have begun to alter some of the patterns of women's work in the 1980's."

It is with great pleasure that I welcome you to this important conference on Women, Clerical Work, and Office Automation. In the Bureau we feel that this topic is of singular timeliness and importance for working women, and we are delighted to sponsor this conference with the National Academy of Sciences.

For a number of years the Bureau has been keeping a careful eye on the formidable progression of the computer-based technologies that have been descending upon the American workplace, and we have become concerned about the way they have begun to alter some of the patterns of women's work in the 1980's, particularly their impact on the millions of women who hold office jobs and various kinds of jobs across the United States.

That is the reason why we have convened this group of very outstanding researchers and experts. We want to hear your thoughts on the issues, and our aim is to ensure that the new office technologies, like the word and data processing systems, work to the advantage of women clericals and not to their disadvantage.

Specifically we ask your help in defining the most critical issues facing women in the electronic office today, so that we in turn can pinpoint the kinds of information we must collect and disseminate--information which can be used to develop sound policy recommendations here in Washington at the national level, at the community level, and in individual companies.

The Women's Bureau has a long and distinguished history as a guardian of women's interests in relation to technological change and employment. The agency actually evolved out of changes, including technological ones, that were brought about as a result of World War I and also changes resulting from the influx of women into the labor force at that time.

Note: Dr. Lenora Cole Alexander is no longer employed at the Women's Bureau.

In the 1920's and 1930's the Bureau undertook exhaustive studies of women in white-collar jobs and their working conditions. These studies helped to set standards that guided legislation on women's employment for half a century. For example, a study in the 1930's looked at women clericals in insurance and publishing firms, banks, investment houses, and public utilities. A subsequent study examined some of the 43,000 office workers in those same industries in seven cities. This research examined not only wages and training but also working conditions, including the effects of mechanization. Since the last study focusing on technology, which was in the late 60's, many changes have occurred in the labor force. We have been a part of it; we have witnessed it. Many of us have made contributions to those changes.

Today women are surging into the labor force at the rate of nearly 1 million a year, and there are some 50 million women currently in the labor force. Working patterns have changed. The two-job couple has become the rule rather than the exception, and the number of families headed by women has nearly doubled since 1970. Working mothers are much less likely to leave the labor force even when faced with increasing family responsibilities. Women's expectations are also rising--and so is their sense of entitlement--but these expectations are too frequently checked by women's concentration in low level, undervalued clerical jobs that are characterized by low pay, little if any chance for upward mobility, and lack of recognition.

To this add the new computer-based technology and the massive labor market shifts of deskilling and reskilling that accompany it, and you have the situation that makes women far more vulnerable than ever before because the jobs they typically hold are the ones most susceptible to technological change. Thus this conference, which is a keystone of the Women's Bureau's national initiative to provide leadership on technology and women's employment issues, represents a new focus and thrust for the Bureau.

As many of you know, the Bureau has awarded a contract to the National Academy of Sciences which, through its Panel on Technology and Women's Employment, will carry out the first phase of that initiative. The Bureau plans to produce several publications designed to inform specific audiences about the changing office.

I ask you to be as painstaking and comprehensive as possible in drawing up your recommendations at the end of today's workshops. This will help us to design our initiative so that it will have the greatest impact on women's work lives and their economic future. Your recommendations may ease fear for the future or they may exacerbate the anxiety about office automation already in the minds of women and men. Whatever the concensus of this day is, the Women's Bureau has a vital self-interest in your knowledge and judgment.

GOALS AND OBJECTIVES

Mary Murphree, Ph.D., Conference Coordinator
Women's Bureau

"It is an opportunity for scholars and researchers committed to women's issues to go on record with what they see as critical issues facing working women, as they relate to changes being wrought by the introduction of computer-based equipment."

A conference like this can be an excellent event in a number of ways. It is an opportunity for people from a variety of academic disciplines and organizations with varying research objectives to come together to exchange information or, pure and simple, to talk shop. It is also an opportunity for many of you--the younger scholars and the older scholars--to enlarge your research network. But most important, it is an opportunity for scholars and researchers committed to women's issues to go on record with what they see as critical issues facing working women, as they relate to changes being wrought by the introduction of computer-based equipment.

It is a day for frank discussion and thoughtful dialogue. A panel will put before you seven issues that we find preliminary research indicates are critical. Then, we will deal with the methodological problems that research on office workers inevitably entails--problems ranging from lack of comparability of occupational classifications, problems of getting access to research sites, problems of measuring the work satisfaction and productivity of secretaries.

As we work toward achieving consensus in our research recommendations, I urge you to keep two things in mind. First, consider the changes wrought by word and data processing on the daily work lives of clerical workers. In our discussions we should continually ask what it is that women want and what they feel increasingly entitled to--such as good pay, more mobility, challenging work, and occupational respect--and how does what they want intersect with what is occurring in offices in relation to computer-based equipment. Second, consider the need for policy development. For example, which issues demand a policy response at the National level, the State and local level, or at the level of the individual firm? What research needs to be done to inform policymakers at the appropriate level and how can that best be achieved?

ROUNDTABLE:

DEFINING THE ISSUES

EMPLOYMENT PROSPECTS

Carol Jusenius Romero, Ph.D.
Economist, National Commission for
Employment Policy

> "There are two conflicting forces. The question is: Will computer equipment be introduced so rapidly and in such numbers that the forces leading to increases in demand for workers are overwhelmed by decreases in demand for workers because of the higher productivity resulting from computer-based equipment?"

Over the past few years word processors have been introduced into offices, automatic tellers into banks, and robots onto factory floors. We have been told that this is just the beginning, and that the "office of the future" will have no paper or files. By implication, few typists, secretaries, or file clerks will be needed. Further, because of robots the factories of the future will have few workers. It is important, however, to have an accurate scenario of the future demand for workers. Office occupations--the jobs in which women predominate--are being strongly affected by computers. Education and training institutions as well as women themselves need to know in which areas training is likely to pay off in terms of job opportunities.

In contrast to the bleak employment picture implied by the offices of the future, statistics indicate that there will continue to be a demand for clerical workers. According to the Bureau of Labor Statistics (BLS), there were 16.4 million clerical/administative support workers in 1983. BLS projections indicate that a decade from now clerical workers are likely to number between 23.5 and 24.5 million, and will constitute about 19 percent of all civilian workers. Clerical occupations such as bank tellers, secretaries, typists, receptionists, and telephone operators are projected to increase.

Why do BLS projections forecast increases in clerical occupations while others foresee few opportunities in the offices and factories of the future? The first reason is that BLS projections consider economic growth. Continued increases in the demand for products and services will increase demand for workers and firms that produce them. Second, the forecasts recognize that technological change typically makes firms more competitive in international markets. This increased competitiveness increases the demand for workers in the firms that produce the goods.

Computer equipment, of course, offsets the forces which work toward an increased demand for workers. The equipment permits workers to produce more than they could otherwise: increased productivity.

So there are two conflicting forces. The question is: Will computer equipment be introduced so rapidly and in such numbers that the forces

leading to increases in demand for workers are overwhelmed by decreases in demand for workers because of the higher productivity resulting from computer-based equipment?

To address this question we need first to look at the prices of the different types of computer-based equipment. Robots cost $60,000 and up; mainframes, about $1 million. At the other extreme, micros cost as little as $1,500. Prices of the equipment are important because they in part determine the rates at which firms will buy and use them. The more expensive the equipment, the slower the rate of its adoption.

This point suggests a further question--will minis and micros, equipment used in offices, be adopted more rapidly than the more expensive machinery that goes onto factory floors? A report sponsored by the National Commission for Employment Policy, "Perpsectives on Technological Change: Historical Studies of Four Major Innovations," sheds some light on this question. The report isolates factors that serve to slow the rate of diffusion of innovations. First, a period of gradual improvement and modification in new equipment is usually necessary before it is widely adopted. Second, uncertainties about technological standards and the incompatibility of equipment may encourage potential customers to wait until these problems are resolved. Third, competition persists from the old technology--typewriters, paper, and telephones are still with us. Fourth, a period of exposure to the new equipment, or learning by using, is often necessary before its full advantages are discovered.

Before the paperless office of the future becomes a reality, a massive network or infrastructure will need to be established within firms and among firms. To illustrate this point, electronic communication is only as efficient as the number of offices that have the equipment and the personnel fully trained to use it, and all this takes time. Of course, there may be rapid spread of individual stand-alone work stations, and the growth in demand for typists may be slower than it otherwise would be. However, revolutionary changes which drastically reduce the need for office personnel are unlikely to occur.

In the meantime, for information on the effects of computers on jobs, we must rely largely on (1) case studies, (2) what we have learned from history about diffusion of innovations, and (3) employment projections such as those of BLS. Data are needed on the speed with which computers are spreading, how the equipment is being used, and in which occupations it is being used. New information is required to dispel the current hyperbole about the office of the future and to assure that public policies are based on facts, not fiction.

QUALITY OF JOBS

Bonnie M. Johnson, Ph.D.
Manager, Office Systems Development
INTEL Corporation

> "We have a 5-year period that we can look at and say, 'What happened to jobs during that time?' The conclusions are many but one thing learned is that the technology seemed to impact in a positive way the self-image of people doing those jobs. . . .A major reason why some people are resistent to technolgy is fear not of the technology itself but of being stranded."

First I will share some of the results of research I conducted between 1981 and 1983, with a grant from the National Science Foundation, on the implementation of word processing; then I will focus on a special program at INTEL which provides equipment operators an opportunity for continuous learning.

The history of word processing, in terms of jobs, spans about 5 years. Word processing jobs came into existence in large numbers in 1978 and went out of existence essentially in 1983, as personal computers became so cheap that instead of centralizing and creating word processing jobs, word processors were simply distributed to secretaries. So we have a 5-year period that we can look at and say, "What happened to jobs during that time?" The conclusions are many, but one thing learned is that the technology seemed to impact in a positive way the self-image of people doing those jobs.

To examine the implementation of word processing, about 200 organizations were surveyed by telephone, 60 organiations by on-site visit, and about 300 operators and managers by mail questionnaires. The 300 operators were asked, How have you changed since learning word processing? Eighty-one percent of them said that they were more likely to try new things; they had come to think of themselves as more innovative. Fifty-two percent said they were more likely to meet new people. Fifty-six percent said they were more likely to demand a higher salary. Sixty-seven percent of them said they were more career oriented and they were more demanding in seeking promotions. Almost across the board they said that they thought better of themselves since they had learned to use word processing equipment. That was true of those operators in distributed settings as well as those in word processing centers.

We asked a whole series of questions about ergonomic issues--the glare of the screen and backaches, for example--and found that their complaints were much like the complaints of clerical workers regardless of technology. The biggest complaint--by 43 percent of the operators--was a lack of privacy in the open offices. The second biggest complaint was a lack of storage. The third--33 percent--was noise (also smoke), and tended to be greater for

people in word processing centers. The fourth biggest complaint was a lack of desktop space.

We asked operators: "If you were to seek another job, what kind of job would you want? Would you want another word processing job?" Eighty-eight percent of them said, "Yes." We heard almost overwhelmingly that they would never want to return to becoming the traditional secretary.

We heard the views of a lot of women who, for the first time, found that they had jobs of their own. They could control their work pace, and being able to exercise discretion was a large part of their satisfaction with the job. Essentially we found that learning word processing seemed to improve self-image, that the major complaints of space and privacy are not new, and that the impact of technology was created mostly by the management structure. Large centers (more than 5 operators) simply did not work out, and the organizations disbanded them largely in their own self-interest.

Turning now to my experience of implementing word processing technology at INTEL--an organization that never had word processing centers --my major effort has been to create continuous learning centers. A key issue is that we have evidence which shows that you must invest as much in learning as you invest in equipment. That is about $1,000 per year per person. That is about what a personal computer costs. That is about what continuous learning costs.

In the program at INTEL clerical workers can get membership in a continuous learning center. That means that they can go once or twice a month for continuous training. In many word processing centers people are constantly learning and training each other. But when machines are distributed a special effort is needed to encourage and ensure continuous learning. A major reason why some people are resistent to technolgy is fear not of the technology itself but of being stranded. So we have experts who assist the operators when problems arise. We made a commitment to the operators that we are there to support them, and we found that as long as people think they are not going to be stranded, they will use the equipment--and their job satisfaction will increase with it.

Finally, I want to stress the importance of career ladders. Change takes place in organizations when organizational decisionmakers think it is in their best interests. So if we do not have research that ties in the quality of jobs, career ladders, and racial nondiscrimination policies with what companies have to gain in terms of the current investment and productivity, we are just trying to push the ball uphill. Unless we can show those kinds of relationships I don't think Federal policy is going to get us very far at all.

PAY EQUITY AND CAREER OPPORTUNITY

Judith Gregory
Research Associate, Department for
Professional Employees, AFL-CIO

> "The point systems that are used for job evaluations and for evaluation of skills are crucially important because the intellectual problem-solving nature of clerical work has traditionally been left out or not given adequate attention in research. . . ."

Office computerization is occurring at a time when the momentum for pay equity has been building. It is also occurring at a time when there is attention on career mobility issues and what these mean for the long-standing social goal of equal opportunity and affirmative action for women and minority workers.

The four areas on which I shall comment are:

o The intersections of pay equity and office automation, and the research and debate on whether skills are upgraded or downgraded in relation to automation;

o The critical importance of involving workers in their own assessment of skills, as well as worker representatives' assessments of skills, in the research and ongoing evaluation of changes related to office automation;

o The organizational setting and conditions of work, and how they affect skills and career mobility;

o Career mobility and the importance of reinjecting affirmative action and equal opportunity into the discussion on women's employment and technological change.

It is crucial to understand the intersections between pay equity and office automation. There is seemingly contradictory research where one study finds deskilling of clerical work and another study finds upgrading. More recent analyses describe a pattern of "upskilling but downwaging." We need to identify more carefully the technological level of the company and of the programs being undertaken.

There are short-term and long-term effects of changes. While deskilling may occur to an occupation or within the occupational structure of a company, for individuals in that company the experience can be much different, and can be one of upward mobility.

In response to the second area of comment, a more dynamic way of involving workers in the research and evaluation of what happens to skills in computerization is by asking them: What were the skills they had been

using and which of those were recognized by their employer and rewarded? Which of those faded away and which carried over when the job was changed with new technology? Which of the new skills as well as skills that carried over are recognized and rewarded? This process can help to identify what new skills exist and which are valued or reflected in a person's paycheck.

The point systems that are used for job evaluations and for evaluation of skills are of critical importance because the intellectual problem-solving nature of clerical work has traditionally been left out or not given adequate attention in research. This omission is one of the major reasons for the chronic undervaluation of clerical work.

In the third area--the organizational setting and conditions of work--studies show that skills and mobility of workers are very much related to the latitude and support workers are given. So the narrowness or breadth and depth of training and whether workers have the freedom and time to experiment and develop skills and applications as fully as possible on the new systems is closely related to skills and mobility. Researchers have also identified as a problem the increased distance between the designers of systems and the people involved with the content of work. This has been a problem, too, in the physical separation of clerical workers from the departmental context of work, as in word processing pools and other specialized, isolated units. Again, this is related to the underestimation of the intellectual nature of clerical work.

The fourth area is that of career mobility. What the job structure is going to be in a given company and what the structure is going to be for the office work force as a whole is still in flux and is being debated. Research on the insurance industry has described a shift from previous barriers related to discrimination which held back women and minorities to a new kind of technological encasing of barriers which threaten to reduce the mobility for women and minority workers in that industry. This has been described also as a skill gap or a polarization of the work force. An analysis of research is needed to determine what the company practices are in various settings that contribute to that gap or polarization--not accept it as a technological imperative--and what company practices provide positive models to keep opportunities open.

I have emphasized areas where technology is in flux, and I want to point to a counter example where there is transition and flux but highly developed technology in the phone company. Research that has been done by the Coalition of Labor Union Women indicates that women and minority workers, minority women in particular, are often moved into positions that may be transitional or may be vulnerable especially to further change or to elimination. This presents a more troubling piece of the puzzle, a picture different from the more fluid and optimistic points I have discussed.

TRAINING AND RETRAINING

Joyce Dudley
Assistant Director, Education Fund
American Federation of State,
County, and Municipal Employees, AFL-CIO

"Basically, clerical workers are concerned about having access to training, whether that training is brought to them by their work setting or whether they have to go out and search for that training themselves."

I would like to bring two perspectives to the discussion. As an administrator in a labor union, I would like to bring some sense of the pulse of workers, at least in New York City, and secondly, as a researcher at New York University, I would like to express some of my thoughts on the state of the art in terms of research and the implications of that research for training.

Let us start with clerical workers and what their concerns are. They are concerned about job loss, about contracting out when that does occur, and about situations where individuals are brought into their work settings and trained in lieu of training currently employed clerical workers. They are concerned also about seemingly unfair processes in selecting individuals for training or the lack of selection processes for training. Basically, clerical workers are concerned about having access to training, whether that training is brought to them by their work setting or whether they have to go out and search for that training themselves. These concerns may be indicative of the fact that the implementation of office automation is in transition and therefore some structures are not in place in work settings.

Office automation has basically redefined the relationship of office workers to their jobs, and this has called for attitudinal changes on the part of clerical workers. They find themselves in settings that are in a transition phase, where they can no longer predict either their work roles or their interactions with other people, so they have to use other types of skills. It calls for proactive attitudes rather than passive or reactive attitudes.

Note: Since the time of the conference, Joyce Dudley has assumed the position of Deputy City Personnel Director, New York City.

Now let us look at some of the myths that are behind some of the conceptions that clerical workers and others have about office automation. One myth is that word processing and computer technology are difficult. But very often the difficulty relates to work setting issues and to the way implementation occurs. Another myth is that skills required to do well in office automation are gender related. This misconception may have arisen from informal discussions about new types of skills that are needed in automated office settings, and clerical workers assume that there are certain gender issues involved in doing well in technological settings. This, of course, is not true. The third myth centers around technophobia. Women are basically not so much afraid of technology as they are fearful of what technology threatens to do to their job stability and job security. So the technophobia seems not to be a phobia in relation to the technology itself, but to the implementation. Another myth is that office automation is a ticket to mobility and a ticket out of a career rut. It is not always a ticket out of that rut.

What are the training needs? Research has shown that there are two types of training that must occur. On one level there is a need for technical training of people in specific areas of office automation, and at another level there is a need for broad-based nontechnical skills training required for automated office settings. We also need to train for flexibility. We need to make it clear that training will not stop once women learn the new types of work. Changes in the work setting brought on by technology will continue. In addition, we need training that is sensitive to the developmental and life stage needs of the trainee.

What is behind these needs? Clerical workers basically adapt to technology in three ways. They adapt to specific skills and tasks, to the technology and equipment, and to work roles and environments.

A recent study by the Rand Corporation showed that the most critical problem in implementing an advanced office automation system lies not in the technology itself but in basic characteristics of the organization--how the organization is structured, how it responds to change, and how it considers the human factors involved in office automation. Therefore, in training and retraining women for new technologies, their ability to critique, evaluate, and analyze their work settings is a critical issue. We have to train women to be proactive, so that along with technological skills they have a broad-based understanding of how office automation is affecting their entire organization and what role there is for them.

What has research to date shown? Research has clustered around three areas. The first area is in identifying the skills needed for success in word processing. Studies have pointed again to two types of skills--the technical skills including typing and the grammatical and language art skills; and the nontechnical or human relations skills such as listening, negotiating, interacting, and mediating skills. In the second area, researchers have highlighted other human factors involved in the successful implementation of a word processing program, including strong motivational and attitudinal levels on the part of the workers and a supportive

management base. The third area of study recommends that training programs for clerical workers, whether in word processing or otherwise, should include human factors, automation, and information management skills.

There are some questions that we need to ask. For example, when the studies outline skills needed to be successful in word processing, how are they defining that satisfaction or that success? What is the relationship between satisfaction in word processing and length of employment or the time between the implementation of word processing and that particular study? What do we need in order to develop more effective training programs? I think we need research that tells us how people adapt to technology at different stages of the implementation process. The results of evaluating job satisfaction or the skills needed by word processors if the system has been implemented in an organization for only 6 months or 1 year will be different from the organization that has had word processing for 2 or 3 years.

We also need research that concurrently looks at personality and work environmental factors to clarify the relationship between the two. For example, how does the personality type of clerical workers affect the implementation and design of office automation systems? We also need research that looks at the interaction between work environments, implementation models, and the worker personality characteristics. Finally, we need case study research and longer range research to tap the individual experiences of clerical workers during this period of rapid change.

At the community level, we need to disseminate information and continue to have forums to discuss the issues. As the Task Force on Women in Office Automation in New York City does, we need to take information out to clerical workers, as well as to managers and supervisors in the clerical sector, to keep these issues alive and to encourage clerical workers to take a more proactive approach to office automation. We need counseling programs, both at work settings and in community settings, that encourage clerical workers to make decisions on where they fit into the technological scene. Office automation is but one small part of the larger course of change that is sweeping through the world of work at a rapid and steady pace. When we think about training, we must do so in a way that encompasses this important factor. We must train for technology, but we must also train for those skills that will enable office workers to continue to adapt comfortably to change.

EMPLOYMENT DISCRIMINATION IN TODAY'S AND TOMORROW'S ECONOMY

Thierry Noyelle, Ph.D.
Research Scholar, Conservation of Human resources
Columbia University

> "When EEOC first addressed the issue of equal opportunity it focused on opening internal labor markets to women and minority workers to correct for past discrimination. This strategy is losing strength, however, because the importance of internal labor markets is weakening for two major reasons . . . the rise of higher education and technological change."

There always have been fundamental linkages between training opportunities and employment opportunities. The EEOC has traditionally focused on such linkages to develop strategies that can help women and minority workers improve their positions in the labor market. Today, however, the linkages are changing from what they were in the 1960's and 1970's. The changes came from at least two major forces--the expansion of higher education and technological change.

In recent years a number of researchers, including myself, have attempted to understand what is changing in the way companies train and promote people. My own focus has been on service industries, which have been among the fastest growing sectors of the economy and are those where the great majority of women and minority workers are employed. During the 1950's and 1960's the principal routes for mobility were through internal labor markets, that is, through job ladders that were primarily firm-based or industry-based structures. This was the case in both manufacturing and service industries. In the insurance industry, for example, young workers would enter as messengers, move up to statistical clerk or claims clerk positions, eventually to policy taker or assistant underwriter positions, and possibly even higher. In department stores, workers entering as stock clerks moved onto the floor, perhaps became commissioned salespersons, department managers, or even buyers.

When EEOC first addressed the issue of equal opportunity it focused on opening internal labor markets to women and minority workers to correct for past discrimination. This strategy is losing strength, however, because the importance of internal labor markets is weakening for the two major reasons I mentioned earlier--the rise of higher education and technological change.

In 1960 only 10 percent of the population between 25 and 29 years of age had gone to 4-year colleges. Today this share has risen to 25 percent. In between there has been a radical transformation in the makeup of the labor supply and, in turn, a transformation on the part of companies in the way they hire and in the way they promote people. In earlier years the internal promotion procedures were used by firms to move "non-exempt" workers into professional and managerial positions. But as larger numbers

of young people went to college, more and more companies responded by hiring college-trained people straight into managerial and professional positions, resulting in a weakening of the traditional ties between those upper level jobs and lower level positions.

The other change, which is relatively more recent, has to do with the introduction of the new computer-based technology, which is having a very dramatic impact on the division of labor. The thrust of the impact of the new technology is on the middle range of the occupational structure. Several things have happened.

First, what used to be different jobs are often becoming more and more similar as some of the tasks associated with them are computerized. For example, the jobs of bank clerks working on electronic fund transfers, insurance clerks working on claims, or ticketing agents working for airlines are becoming increasingly similar even though they are in different industries. In short, there is a tendency toward homogenization and universalization of skills across a very broad range of industries. Skills are becoming more generic. This is acting to push companies to externalize training which is a key issue in achieving mobility.

A second observation is that technological change is often leading to some degree of upskilling if only because it permits elimination of the lowliest jobs through automation. In back offices, for example, automation has eliminated the need for paper files, hence the need for file clerks. In that sense, automation has had a negative impact on youth, since many of the tasks that youth did when entering an industry are the very tasks that have been automated. In many back offices (insurance, banking, public sector agencies, etc.) the threshold for the entry level has been raised, often to a 2-year community college diploma or equivalent degree.

A third observation is that automation in service firms has opened options for companies to move work out of the very large cities into the suburbs or to smaller size cities. This has tended to have a negative impact on the minority population which resides overwhelmingly in the inner cities of large metropolitan areas. Firms that are moving their back offices are typically going to two kinds of areas: where they can link up with a community college which will help them to prepare a new group of workers, both young and old; and where they can already find a skilled labor pool, typically in suburbs where they can hire middle-aged white women. There are also examples of companies moving to areas that have very large military installations, where they can hire retiring military clerks willing to put in a few more years of work. These workers have limited expectations due to their age, which is important because, as I said earlier, those jobs are increasingly less linked to opportunities for upward mobility within the firm.

To conclude, there is both a sharp rise in the threshold of skills demanded from people entering the new jobs and an increasing tendency for firms to hire trained personnel directly from the external labor market rather than trying to train people internally. Hence we must figure out new ways of linking equal opportunity in the workplace with issues of access to and discrimination in education, particularly in higher education. Short of this, the EEOC effort in the workplace is in danger of losing its strength.

WORKING CONDITIONS: HEALTH, SAFETY, AND STRESS

Barbara Cohen
Research Psychologist, National Institute for
Occupational Safety and Health

"If organizations don't begin to treat their support staff as individual human beings instead of as just another part of the automated system, the sad reality may be that we will experience a great deal more stress-related illnesses among these workers."

Since the time of the ancient Greeks, philosophers have declared that the mind and body are two separate entities. Society is still having a difficult time seeing the mind and the person as one whole human being. If there are any symptoms of illness we inquire, "Is this physical or psychological?" We are not internally convinced that the two are so inextricably entwined that one cannot help but affect the other. But this is starting to change as we are hearing more about the mind being used as a viable method in combatting illness. The understanding and the acceptance of this holistic concept is enabling us to understand what an important part stress plays in our lives, from the quality of our lives to how long we live.

Stress is a particularly important issue for women for many reasons, not the least of which is the rapidly changing expectations of women's roles. As we know, well over half of all women work in paid occupations, and many work at home as well. At work they face all of the same stresses as men do--the aggravation and hassles--but in addition they face stresses that are unique to working women.

Aside from one's genetic makeup, women's poor economic status may well be the single most significant determinant of health and well-being. There are serious synergistic effects of not being able to buy nutritional food or enough food; of living in a home that is unsafe or lacks enough heat; of having poor access to health care; and of not having sufficient time and money to obtain that health care or even to fill badly needed prescriptions.

I have been speaking about women in general but too often these problems refer to clerical workers in particular because these workers (who comprise about one-third of all working women) are typically in low income brackets. Many clerical workers are the sole financial support of the family and two-thirds of married clerical workers' husbands earn under $10,000 a year.

A big myth, usually characterized by the first question I am asked when speaking about office automation to groups other than office workers is, "What are those ladies who are lucky enough to have a job in a nice

clean office complaining about?" The reality of how clean and safe those offices are is discussed in the book Human Aspects of Office Automation. It covers many aspects of office automation and how they impact on a human being.

Another myth. Office automation eliminates repetitious and tedious tasks, freeing the office worker for more enriching tasks. The reality is that in too many organizations office automation generates more tedium and job fragmentation. Some office workers only put in data, and if they make a mistake, someone else's job is to correct it. This kind of assemblyline production is not very conducive to having pride in the final product. The workers have complained about feeling more like an extension of the machine rather than a human being.

A third myth. Automatic equipment will increase productivity to such an extent that clerical workers can then be promoted to more satisfying and better paying jobs. That is possible, but in most instances such promotions have been sparse. More frequently, there has been a downgrading because now the work is easier and former skills are no longer needed. In other instances jobs have been eliminated so that the worker loses her job to the very machine that she just learned to master.

Sometimes even increased productivity is a myth. It is not that automated equipment does not have the potential to increase productivity substantially. It certainly does. However, there are many administrative factors that defeat this potential. For example, because the changes are perceived as so easy to make, people giving work to clerical staff feel free to make more and more changes. So what occurs is the same paper getting out more times, not more productivity. A final myth is related to this. It is surprising how little many managers understand about the capability of the equipment they have just purchased. They believe you touch a button here and a button there and presto you have the report. They do not understand that it takes skill to get tables and graphs, for example, to come out just right on the paper. This is extremely frustrating for the clerical worker, and it brings about misunderstandings between the secretary and the supervisor. Because of the way many women have been socialized, rather than express anger or frustrations, they keep their feelings bottled up which can be unhealthy. They also fear losing a job which they need very badly, and that, too, is detrimental to one's health.

Studies indicate that clerical workers have a large percentage of muscle ache, tension headaches, depression, anxiety, and in a certain group of clerical workers, increased coronary heart disease. If organizations don't begin to treat their support staff as individual human beings instead of as just another part of the automated system, the sad reality may be that we will experience a great deal more stress-related illnesses among these workers.

WOMEN AND HOME-BASED WORK

Kathleen Christiansen, Ph.D.
Associate Director, Center for Human Environments
City University of New York, Graduate School

"Home-based work is less than ideal when pursued as a compromise between earning a living and taking care of the family."

The forces driving the development of home-based work in the United States are strong. Current technology could allow millions of information-based professional and clerical jobs to be done outside the central office, either at home or elsewhere. Corporate management has found that home-based work is good for business. In pilot programs it has been found to increase productivity, decrease office costs and staff turnover, and increase the corporation's ability to attract desirable employees. Although there are countervailing forces to the development of home-based work, such as the concerns of labor unions, overall the forces are converging to create a climate that is favorable to working at home. It is within this climate that I want to talk about home-based work as an issue for women.

Sixty percent of all women with children under the age of 18 now work. Yet the social realities of the 1980's make it extremely difficult for them to earn a living and to care for their family.

Home activity budgets have shown that women continue to assume major responsibility for the housework and care of the children, regardless of whether they are working. These women also face limited opportunities for child care. A recent report by the Children's Defense Fund showed that nearly 6 million children under the age of 13 who are in need of child care currently are not known to have it. Yet, most of the women who now work not only want to work, they need to work, and they need to find optimal satisfying arrangements for combining work and family.

Home-based work which can involve computers and computer technology is often promoted as an ideal alternative to these women. They can earn money, and they can take care of their children at the same time in the same place. Yet, how ideal is home-based work for these women, and according to whom is it ideal?

Although some articles in the press point out the downside of home-based work, by and large the work arrangement is promoted as basically an optimal way for women to work and take care of their children. The Federal Government has promoted home-based work in several ways, one of which is the Labor Department's efforts to lift the ban on knitted outer-wear made at home. A bill, the Family Opportunity Act, has been introduced in the 98th Congress which would give tax credits for home computers that are used for either work or educational purposes.

Underlying the promotion of home-based work are several assumptions. The first assumption is that women want to work at home to care for their children. This shows up consistently as the main reason why women are working at home, but I think we have to place this "choice" in the context of the social realities. What are women's alternatives? And how much do they want to work there? A recent study indicates that as the number of children decreases, the number of hours a person wants to work at home increases; as the number of children increases, the number of hours that a person wants to work at home decreases. This holds for either sex.

The second assumption is that women take care of their children <u>while</u> they work. My research strongly indicates that most women do not. They tend to work when their children are asleep or gone. If the children are awake and around, clerical women take care of their children while they work, whereas professional and managerial women are more apt to use supplemental child care. Is that because clerical women want to take care of their children while they work? Is it because the structure of their work makes it easier for them to take care of their children? Or is it because they do not make enough money and have no other options? As a corollary to my research, another study of over 90 women who work at home in either sales or office-related work found that there were two major determinants for women's satisfaction of working at home. One was the availability of a separate work space, either a desk or an office, and the other was the availability of adequate, affordable child care. These women were satisfied working at home to the extent that they could draw on other types of chid care, either from family members, day care centers, or babysitters.

The third assumption underlying the promotion of home-based work is that women like it. They like it better than not working at all. Women say, "I like working at home. It is better than not working at all, and it is better than being a full-time homemaker." For a comparison group, these women look to homemakers not to women who work outside the home.

Another point that makes it somewhat questionable as to how well women like working at home has to do with how they interpret their experiences. Studies have found that women who work at home experience more social isolation than do men who work at home, and the speculation is that this is because women are more likely to work at home as a compromise between child care and earning a living, whereas men may be working at home more as a lifestyle preference and as an expression of a certain personality type. Another point has to do with the fact that stress is a major cost of working at home, and its intensity seems to be associated with the degree of family responsibilities.

In summary, home-based work is less than ideal when pursued as a compromise between earning a living and taking care of the family. The women oftentimes feel isolated, stressed, and, if they are professional women, as if they are sacrificing their career. The research also explodes the myth that women can work at home and easily take care of their children. Research of every type is needed to answer such questions as: Who is working at home and under what conditions? At the micro level, in terms of their own psychology, how do they feel about it? What kinds of stresses do they experience? At the macro level, how vulnerable is this group in terms of pay and other working conditions?

GROUP

DISCUSSION

"The strategic issue . . . for clerical work is to envisage what are the potential divisions of labor." Faye Duchin, Institute for Economic Analysis, New York University.

I would like to make two points--one about job prospects and the other about the division of labor, which I think is one of the strategic issues. With respect to job prospects, I corroborate the impression I have given in my work that by the year 1990 we will probably have more clerical jobs than we have today. But my study also goes on to the year 2000 and finds that in the 90's, while we have been very conservative in our assumptions about technological change and we assume lots of growth, there will be a contraction rather than an expansion of clerical workers. The reason for this forecast is very concrete, because not until the late 80's are we going to see the stand-alone automated office equipment absorbed into integrated text and data processing information systems. That change will disrupt the kinds of functions that are used in an office, and that gets into the subject of the distribution of labor. What is involved here are the tasks that are carried out not only by clerical workers but also by managerial workers and by computer professionals. One purpose of a course I teach about computers in the School of Public Administration is based on the percepton that even if managers are not going to be working with the computer they need to understand information systems; the managers will be able to do for themselves the tasks that computer professionals would provide. The strategic issue, then, for clerical work is to envisage what are the potential divisions of labor.

"The same characteristics of technology that make it possible to work at home also make it possible to work outside the United States." Vary Coates, Office of Technology Assessment.

I would like to add a couple of issues to the agenda. One is that the same characteristics of technology that make it possible to work at home also make it possible to work outside the United States. The export of clerical work can be done overseas in the Caribbean countries where there is very low pay but English-speaking workers. It is already going on to a small degree, but it could get to be important in the future, and there is almost no empirical data about what is happening. The second issue is the differential effects of technology on older women clerical workers. To what extent are they not gaining equal access to training opportunities? What happens to the woman who is doing work at home on a computer, usually piece work? Does she have a benefits plan or is she going to be one of a new class of disadvantaged people when she reaches retirement age?-- because if she cannot afford child care she probably cannot afford an IRA either.

"The issue of labeling office workers who use technology needs to be explored. People who are skilled machine operators might consider calling themselves that." Margrethe Olson, Professor, New York University.

An item for the research agenda that was alluded to is potential changes in supervision of jobs. It is critical that we look at the types of measures that are coming out of technology, and the potential to move this technology to piece rates. Another issue is electronic monitoring. An important issue directly related to that is the technology itself and the way it is designed. We have to question some of the value systems that are designed into technology that permit it to have capabilty for electronic monitoring and excessive measuring. In certain European countries these types of capabilities are illegal.

I have two more observations. The labeling of office workers who use technological equipment needs to be explored. People who are skilled machine operators might consider calling themselves that. I am not sure what kind of implications that would have, except that it would tie skilled machine operators in offices perhaps to skilled machine operators in factories, where people are paid substantially more for being a skilled machine operator. The other observation relates to the kinds of offices that clerical workers are in, such as insurance and banks. Some offices tend to be very low in status within organizations. They are way down in the hierachy, and the office itself has no power. Other office clerical workers are in jobs as support people in higher level offices that may have professional or managerial people, and they are the low status people in those high status offices. Those offices may be concerned with satisfying the needs of engineers, writers, or other professionals, and the needs of clerical people simply are not taken into account.

"In a study on garment workers . . . women who used 12 needles on the machine were still called unskilled workers." Charity Goodman, Conference Co-Coordinator, Women's Bureau (Consultant).

In reference to the machine and the factory--in a study on garment workers that I did, I found that the women who used 12 needles on the machine were still called unskilled workers. I don't think the issue is just factory versus clerical. I think the issue is what happens with the labeling.

"We need to look at the entire functions taking place in any particular work setting and how those functions are likely to be distributed." Barbara Baran, Department of City and Regional Planning, University of California.

When we address the issue of clerical work we should pull back from just talking about clerical work and start to look at the transformation of white-collar work in general in an office place. I am looking at the insurance industry, and one of the important things going on there is the automation of professional work. What that means, in part, is decreased mobility for women in those companies. Because low-level professional work is disappearing, low level clerical work is disappearing also, so on some levels there is a generalized upgrading of clerical skills. We need to look at the entire functions taking place in any particular work setting and how those functions are likely to be distributed.

> ". . . We want to be careful not to second guess what an individual woman worker may like to do. If it is not an ideal option, maybe it is the preferred option. Ideal may not necessarily mean the best but better than what else is available." Kristine Iverson, U.S. Senate Committee on Labor and Human Resources.

One comment on the homework issue--and this you can interpret generically. In trying to determine what is an ideal situation for women workers, we want to be careful not to second guess what an individual woman worker may like to do. If it is not an ideal option, maybe it is the preferred option. Ideal may not necessarily mean the best but better than what else is available. We are talking about creating opportunity. So when we talk about quality of work, I think it is extremely important to factor opportunity into the discussion, but I think we want to be careful about how we factor it in to avoid making judgments on what individual women workers might prefer relative to what else is available.

> "My concerns are that homework not be promoted . . . in lieu of other alternatives." Kathleen Christensen, Center for Human Environments, City University of New York.

I agree that homework is an option, and I agree that within other alternatives it will probably be preferred by many women. My concerns are that homework not be promoted without critical examination of what the effects on the women are, and that it not be promoted in lieu of other alternatives. The reality is that women are going to work at home, and I think any attempts to say, "no they cannot," are unrealistic. I think that we have to go in two directions--one of which is how can we best protect the worker in the home under a variety of conditions and how can we also create other alternatives so that women's choices are not as constrained as they are now. I am not against homework. I am for other alternatives for making it the best condition possible for women when they do want to work there.

> "There are areas which have had a management explosion--an explosion of lower management and

lower levels of supervision that are predominantly women." Karen Sacks, Research Director, Business and Professional Women's Foundation.

I want to follow up on an earlier comment. As the insurance industry seems to have an absent middle, there are areas which have had a management explosion--an explosion of lower management and lower levels of supervision that are predominantly women. If you look at the kinds of work that these women are actually doing, much of it is clerical work, and to a certain extent they seem to be replacing clerical workers. This relates also to the point about channeling labor markets. We are finding that these kinds of developments are adversely impacting on minority and working class women across industries in a much more severe manner than they had before.

"If the training participants cannot spell and can hardly type, and are not used to coming to work on time, it doesn't make any difference how magic the machine is." Howard Jenkins, representing Opportunities Industrialization Center (OIC) and OneAmerica Corporation.

My first comment concerns training that is not only technical but also broad based and nontechnical in nature, and that relates to the work situation and human relations and motivation. If the training participants cannot spell and can hardly type, and are not used to coming to work on time, it doesn't make any difference how magic the machine is. So there is still a great need for the nontechnical approach to training. My second comment: In the training at OneAmerica we try to instill in clerical workers the importance of their role in using the machines so that they are not strictly taking handwritten material and transposing it on the machine, but that they may feel there is a better way to structure the letter. Perhaps a small business would be a good place to have the initial training, because we have the time and the incentive to take entry level persons and train them. Hence they will have the loyalty to stay with the company and we can help them grow. So I am promoting the training aspects of women in the field of automation.

"I don't think bringing homework back does this country any good or especially the women any good; I don't believe it is a viable or desired option." William Hoffman, Professional, Technical & Salaried Conference Board, IUE, AFL-CIO.

The industrial revolution didn't start yesterday, it started some time ago. We have spent a lot of time doing away with homework, and now there are people trying to pass bills to bring it back to the home. I don't think bringing homework back does this country any good or especially the women any good; I don't believe it is a viable or desired option.

"What we have to look at is not only the conditions of automated offices within the home but also the nature of clerical work within the factory setting."
Eileen Boris, Department of History, Howard University.

I want to address the issue of homework in a slightly different way, that is, the interrelation between electronic homework and automation within the office setting itself. What we have to look at is not only the conditions of automated offices within the home but also the nature of clerical work within the factory setting. It is that interrelation which, historically, the various regulations were fought against for factory standards. We also have to be concerned about the impact of women's work within the home in terms of women's positions within society, and the association of women with home and children to the very options women have within the automated factory.

". . . In virtually every sector, regardless of what skills are required to do the job, employers want broadly skilled workers . . . ." Timothy Hunt, W.E. Upjohn Institute for Employment Research.

In trying to place dislocated workers and minority group people in State and local jobs in the Michigan area, the surprise, in 1984, was that the public sector was not necessarily receptive to hiring these people. So what is going on in the insurance field and other industries is also going on in government itself. Here, too, the employers want workers with higher skills, more abilities. They would look at the qualifications of these workers and say basically, "we don't want them." Apparently in virtually every sector, regardless of what skills are required to do the job, employers want broadly skilled workers to fit in with the offices and to gain some assurance that the workers are going to stay in those jobs.

"Black women particularly come to . . . technical change from a historical position of aspiration, not of last resort which is the way the white middle class has approached clerical work." Mary Fillmore, Chestnut Hill, Massachusetts.

I hope that people will be mindful of the differential impact on women of color of all the issues that we are discussing. Black women particularly come to this whole business of technological change from a historical position of aspiration, not of last resort which is the way the white middle class has approached clerical work. So I think it is really important that we keep that foremost.

"Clerical workers . . . are unhappy that the skills they are acquiring in computer-related tasks are not reflected in their job categories, either toward pay

or in terms of their title." Valerie Carter, Gradute Student, Department of Sociology, University of Connecticut.

I would like to raise the issue of pay equity and how it relates to office automation. It has to do with job categories. A number of clerical workers that I have talked with in my preliminary research are unhappy that the skills they are acquiring in computer-related tasks are not reflected in their job categories, either toward pay or in terms of their title. Until the pay categories and job categories are revised to reflect those changes, their skills are going to be only informally recognized by office status.

"In the support for homework as an alternative for women to work at home, we must be careful that it does not detract from major efforts to cure the real problem as I see it--a lack of quality day care." Dennis Chamot, Department for Professional Employees, AFL-CIO.

One of the things to keep in mind as policy options are made is that the options are stated in such a way that they do not detract from other activities. One example is the question of homework. Whether there is or is not a need for it has been discussed back and forth. We cannot ignore the historical realities of why certain work has been banned in the past, and we should not ignore what is happening in the foreign experience, which has not been discussed very much. For example, the Swedes are developing an enormous system of quality day care. They have a very large percentage of their women working, not just in women's jobs. Why can't we do that here? In the support for homework as an alternative for women to work at home, we must be careful that it does not detract from major efforts to cure the real problem as I see it--a lack of quality day care.

"The kind of research suggested will allow us to rethink things, not the least of which is invisible labor." Benjamin Amick, III, Office of Technology Assessment.

One important question is, How do we articulate the type of approach that is being championed with a broader national public policy? The kind of research suggested will allow us to rethink things, not the least of which is invisible labor. How we draw up a job description has tremendous import for comparable worth and pay equity, for racial equity, for gender equity, as well as for redefining productivity.

INTRODUCTION OF KEYNOTE SPEAKER

Clinton M. Wright
Deputy Director, Women's Bureau

> "We see in her work all indications of a strong professional commitment not only to her subject and its new machinery but more important to the people who use the machines."

What I have already experienced here today is almost unbelievable for me, and I know there is much more to come. I express thanks to all those persons at the Academy and at the Bureau who worked very hard to bring together this conference. Today we are realizing the fruits of their labor. But even more important we have great expectations that today's input and output from all of the participants will bear fruit in the days ahead.

You have been invited to identify the major issues primarily because of your expertise, and also because of your concern and commitment to working women. I know that this is not an easy task, but a credentialed group such as yours is decidedly up to the job. You include women as well as men. Some of you are scholars who are doing pioneer research on the subject of women and computer-based technology. You come from academia, the corporate world, unions, women's advocacy groups, and government agencies. And I am pleased to say that our keynote speaker has had experience in most of those areas.

Dr. Eleanor Wynn has impressive skills that she has acquired and applied in a wide variety of settings. She is an expert in research, planning, and evaluation of technical office systems. Indeed, her experience includes those of researcher, educator, anthropologist, and international affairs specialist. She is a prolific writer whose works have been published widely in technical journals. We see in her work all indications of a strong professional commitment not only to her subject and its new machinery but more important to the people who use the machines. Ordinarily the users are women, our women, the women the Bureau exists to serve.

Note: Since the time of the Conference, Clinton M. Wright has retired from the Women's Bureau.

KEYNOTE SPEECH

OFFICE AUTOMATION: A BRIEF HISTORY OF THOUGHT

Eleanor Wynn, Ph.D.
Market Analyst, Bell Northern Research

"Computerization does not mean a change for the worse. On the contrary, it can be enhancing to the tasks themselves and to the people doing them. However, it has less chance of being a net improvement to the organization if the degree of 'granularity' needed for analysis, that is, the level of detail available to the task worker, is ignored.

I would like to present some of my observations made over the last 9 or 10 years of experience with the subject of society and computer technology. Many of my thoughts have been reflections on how other people seemed to think about this subject: the ways I saw participants in office automation, both vendors and "users," attempting to conceptualize a change of this magnitude, and trying to devise strategies for managing it to their advantage. What I saw concerned me as an anthropologist, because it has been apparent that the lack of sociological scope and theoretical perspective the bulk of participants bring to a major social transformation like this is a limitation on effective solutions. At the same time, most of the people that I have observed have clear and valid views about events close to them, but they give themselves too little credit. So, much of the common sense that is available to be applied is neglected. In other words, in attempting to conceptualize about social issues relating to technology, I have seen many participants leap to poorly formed high-level concepts, while at the same time failing to credit their own and others' first hand observations of work-related details that they really know about.

Conceptualization is a major issue in every aspect of computerization. First of all, computerization is totally different from mechanization, the previous technology revolution, in that mechanization was almost "all hardware," whereas computerization places a major emphasis on software. In hardware, once the die is cast, the organization is constrained both by its physical existence and its original design. Software is concepts. Although there are clear machine-based limitations, software allows an incredible variety of plans and designs, and it can be changed.

Note: Since the time of the Conference, Dr. Eleanor Wynn has been associated with Brandon Interscience, Inc., a communications consulting firm in Palo Alto, California.

In considering the workplace, a set of concepts about what is done there and how it is done must be translated into software concepts to be implemented in a program. This is a critical juncture, and yet the method for doing this conceptual transfer is not at all a clear science. How a manager, a systems analyst, or a technical person approaches a task in order to analyze it is a situation with concepts already built into it. Certain realities appear to be self-evident, which are in fact prejudices or assumptions that need a careful examination in light of the task. Yet it is often the case that the task itself and the person performing the task are not examined in enough detail to replace the assumptions with real information. So the great potentialities implied in the flexibility of software-based work design are often underutilized.

One conceptual problem that arises in computerizing a task relates to how the task was perceived prior to the attempt to redesign it for computer-based routines. Many of the tasks and routines performed in large organizations are based on a package of unrecognized skills provided to the organization by the worker. The organization unknowingly has relied heavily on the social background and implicit problem-solving abilities of its workers, even in some of the most routine clerical tasks, to fill in the gaps in its formal procedures. In this way the procedures were made to fit with the varying situations encountered in the process of doing business. Because of this, it looked as if the procedures themselves worked. In interviews, clerical workers have described the common sense things they do to work around a procedure as "illegal" or "cheating"; yet their activities caused a smoother flow of work and a timely completion of sequences that enabled the organization to meet its own performance objectives.

Once computerization arrives, many aspects of a task must be made more explicit. There is a belief that the procedures, as written, work. This is partly because they have been made to work in the past. The results can take a number of forms; inflexibility is one well-known example. Suddenly the structure of the paper record is transferred to the process that produces the record, allowing far fewer varieties of actions than had been the case in the past.

When I first worked on office automation and its social implications, my interest began with social interaction and its effect on the communication of work-related cognitive information in the workplace. As I examined the conversations of clerical workers, I found that an enormous amount of procedural and status detail was being communicated along with more personal content. Although functionalist analysis in traditional sociology has broken these two elements and some other "functions" out as separate components of a task-oriented event, I felt that it was artificial to isolate the "task-oriented" cognitive activity from the "affective" social activity. Instead, I showed in detailed conversation analyses that in cognitive work the social environment is in essence the medium by which information is conveyed. The functionalist analysis implies that the social environment and its information aspect can be separated from each other.

Moreover, I found that there was ambiguity in the events that presented themselves from the world outside the organization. A regular flow of "nonstandard" events required clerical workers to interpret these events from their common sense so as to make sense to the procedure. Clerical interactions involved a good deal of identification, labeling, reconstruction of partial event histories, and, of course, locating fields on forms that would best fit odd facts that came in. Just one simple instance: the form asks for a delivery address. The equipment is to be delivered to a barge to go to Alaska. The barge dock location is not predetermined. A phone number must be used. Where does the phone number go? It is not an address in form but it is the functional replacement for the address. This may seem minor, but it must be recalled that the order cannot go through without a completed form. The form has to be actionable in the precise terms the system expects. It is possible that the procedure will reject a telephone number in an address slot, or again, it is possible that it will reject a form with an empty address slot.

Someone at some point has to know not to send the equipment to the phone number, but instead to call the number. In the latter case, where would the phone number go, how would someone else figure out how to enter later the address once it is known? Such microscopic, yet legalistic, questions come up on an hourly basis in many clerical offices. In other instances, clerks were dealing with partial information, reconstructing from the forms and the content on them what the original context might have been, and then deciding on actions to take from that point.

In the case of customer service, the representative must deal with a constantly changing history of prices that applied at the time of the order that is being adjusted, or of special categorical pricing arrangements. Customer service problems almost by definition do not fit the normal procedures. Therefore, the competent customer service representative must hold in her/his mind a set of patterns of nonstandard events from the past that will provide clues to tracking down the sources of new problems.

Many administrative jobs, especially ones involving clients, require major hand-holding skills called "people skills." Alternatively, they may require negotiative skills in dealing with counterparts in other organizations and persuading them to do something that will facilitate the execution of procedures or the timely performance of actions the other person is not required to do. These skills, which I observed in conversational analyses, also came up in later work I did on field testing of work stations. In the interviews used for this work, I asked clerical workers in a sales order entry office what skills they felt were essential to their jobs that were not named in their job descriptions. I asked these questions over a period of a few years to perhaps 200 clerical and some professional workers. The responses did not differ that much between the two. Organization of one's tasks and "people skills" were the two universally named characteristics, regardless of whether the job was apparently structured and regardless of whether it appeared to be a paperwork job.

What is often missed in the attempts to do task analyses for computerization is the evaluation of these components of jobs. This is disadvantageous to the working person whose job is under analysis and it is a disadvantage to the organization. It is possible that the computer-based environment can accommodate these facts in some fashion, but first they must be acknowledged. Moreover, the work design that results from this accommodation is likely to be different from the one that ignores those facts. What also came out in the interviews is the extent to which the social and cognitive components of jobs go unaccounted for and unacknowledged. There is a dissociation, which many employees have become accustomed to, between what is actually done and what is recognized as valuable.

People are immersed in their jobs for most of their waking hours and try to "make sense of" and organize their intensive environment. Because the employee carrying out a task best knows the ins and outs, peculiarities and exceptions, as well as the statistical probabilities of certain recurring situations, it is a loss to the organization not to avail itself of these details in engineering a change of technology for that task. It is also a loss to the employee in cognitive consistency of their world and in other rewards, however personal, they may have received from being able to negotiate their way through their tasks.

Computerization does not mean a change for the worse. On the contrary, it can be enhancing to the tasks themselves and to the people doing them. However, it has less chance of being a net improvement to the organization if the degree of "granularity" needed for analysis, that is, the level of detail available to the task worker, is ignored. The reasons the employee's point of view may be ignored have to do with some of the conceptions referred to earlier. One is an assumption about the task and the person doing it that equates pay scale, level in the organization, and formal credentials with raw intelligence and the ability to reason about something close to the person's experience.

Beyond the assumption about people and tasks, there is an assumption about how to do research. Scientism is rampant in bureaucratic organizations, presenting a major victory of form over substance in information-gathering. Certain notions about the validity of peoples' statements appear to have been carried forward from earlier generations of psychological research. I can find no other way to explain the prejudice against taking a person's assessments at face value. This belief imposes a dissociative distance upon research that discredits the most reliable source of information, the participant. It seems to be believed that distance, rather than proximity to a problem or person, creates more truth about it. In fact, it is greater detail, which comes from greater proximity and more natural interaction, that presents the most useful information about a task.

Although much valid psychological research has been done in large organizations, and this discipline is preferred over the social sciences per se, there is a trap in the psychological focus. The trap is that this focus portrays an organization as a collection of individual psyches rather than a

social group. It tends to treat the views of these individuals as highly subjective, that is, as having no reliable basis in reality. There is a tendency to focus on people's "attitudes" as totally subjective entities, implying a lack of adjustment and maturity, should these attitudes not favor the program. My preference would be to start by regarding the participants' points of view as practical concerns and reactions to real situations, rather than gloss over them as "resistance."

There is an important difference to be drawn here, since I appear to be saying that low-level employees reason and that management and analysts have "attitudes." This difference has to do with the amount of exposure to the subject in question. I am asserting that an individual of average intelligence reasons competently about things that are daily practical concerns for him or her. This same individual is likely to hold unexamined assumptions about those things that are remote from daily activity. In office automation, I have seen management and consultants attempting to reason about things from which they are remote--someone's daily tasks--while ignoring that person's view of her/his tasks.

I have come across another symptom of the lack of clear conceptual focus in reference to the category of people using computers. That vagueness is demonstrated in the range of values represented in the term "user"--the industry's word for both individuals and collections of people who use the equipment. Three different entities are being referred to by the term "user," entities varying greatly along dimensions of power and accorded ability to speak for their own interests.

First, the organization, meaning the whole company, is a user. This is the sense of user that is meant when a market analyst is asked to go out and find out what the users want. These users are taken seriously. What they say they are and what they say they want are likely to be accommodated in vendors' offerings.

Another level of user is a department. Departments have the power to make a case for themselves and negotiate, but they are subject to overall "system" mandates. Industry journals frequently exhort in editorial columns on the need to "pay attention to the users' needs." By this they mean that data processing centers should stop having such a pure technology focus and get more of a business focus, that is, pay attention to the departments.

The least understood and least represented level of user is the individual who actually uses computer-based equipment to do a nondata processing job. Even within this category, there are inequities based on level, since the professional now has discretion in many large organizations to select personal computing equipment, or not to. The level of user this conference is concerned with is primarily the person with the least power and voice to articulate her needs or even describe her own tasks, and who tends to be observed through the agency of third parties rather than directly taken at face value. Thus, this user is most in need of attention from qualified researchers.

Since the actual users of computer-based equipment are represented, if at all, through third parties, I would recommend a highly qualitative and involved approach as one key method of relaying this user's concerns. This information can then be integrated into a new job design or system representation, which may be different from the old one but will contain the essential functional elements. Another alternative is for organizations themselves to involve these users more, not so much in selecting equipment as in providing perspective on the tasks that can come only from them.

What would be the purpose of doing things differently from the way they are presently being done? Like any other entity, a large company's first objective is survival, and with the widest possible margin of safety. So it is to this interest that we would appeal to in asking for a different approach to understanding the implementation of technology. This different approach is in the interest of the organization, because it concerns the organization's appreciation of its own workings. The point I am making is in some ways a philosophical one. Organizations would be required to redefine themselves, to examine themselves and their own detailed inner workings much more carefully and in a different way in order to automate. The reason is that there have been implicit, informal, unacknowledged processes working in their behalf that they have not had to account for previously, because these things took care of themselves out of the social and cognitive capabilities of their employees. When a change of means is undertaken, these processes may be interrupted or altered. It is therefore useful to know what they are before changing, so that these values can be traded off as precisely as the other values that more commonly find their way into corporate decision models. A much more sophisticated level of research is required to meet this objective than has been the case in the past.

Volume also helps. The isolated case study or survey, done out of the context of a body of research, or of an institution or professional association to critique the ideas and results, does not advance the state of knowledge much. On the contrary, it can lead off on some odd track or put new myths and misconceptions into circulation. Moreover, it is easy to discredit. There it is appropriate for qualified social science researchers from major universities to involve themselves in this arena, if only to create some critical mass of work and thinking.

Speaking to those professionals who want to be a part of this general research effort: you have to speak the language. Rhetoric that does not appeal to the interests of business is easy to discount. It is virtually impossible to go up against a tide as large as the technological and economic forces moving automation. But at this point it is not so difficult to direct it as it might seem. This is because the industry and the user organizations themselves experience so many uncertainties in precisely the areas we have been discussing. Only from their perspective, the question is how to recover the investment in automation. These two apparently opposite interests of return on investment and working person's issues do converge at places, and it is in the interest of all to locate those points of convergence.

I realize that the cooperative model represented here looks naive to some. For instance, it can be said that employees do themselves a disservice by passing their work knowledge over to the corporation. My view is that the interaction in itself is more likely than not to be beneficial in creating a bridge between levels in organizations and producing more appreciation for administrative tasks. For now I will rest with the assumption that a cooperative and mutually beneficial change is possible, and that what I have said points to some simple and yet "radical" means of carrying it out. What is "radical" is a different way of attending to what is invisible and yet obvious all around in the organization: its human intelligence.

RESEARCH RECOMMENDATIONS

WORKSHOP REPORTS

Workshop I. Macro-Level Research on Clerical Employment Issues

Research Issues

Interest at the aggregate level focused on the question: In what areas should we be moving, beyond case studies in insurance and banking, to help aggregate studies? Participants suggested the following areas:

- o State and local government
- o Health care
- o Self-employment
- o Temporary work
- o Multiple job holding
- o Small businesses, including manufacturing

Comments

o Case studies should be more focused and should provide more data intelligence across disciplines. For example, as a part of field work, there is a need to collect information that would include an economic framework. One of the ways to avoid losing knowledge from the fieldwork is to develop a standardized format that scholars could agree upon across disciplines.

o There is a need for international studies so that the United States can begin to explore what is occurring in the rest of the world. What is going on in the rest of the world, however, is not necessarily indicative of what can or should be done in this country.

o There is a need to communicate research in very clear terms, to help managers understand that it is in their best interest to make jobs more interesting.

o There is a need for researchers to have access to workers in order to talk directly with them, so that research studies reflect the workers' perceptions.

o Research is expensive and there is little funding to do macro-level work in the area of "the employment impacts of technological change." Serious thinking must be done on how to set priorities, considering what funding is available for this research.

Workshop II. Micro-Level Research on Clerical Work

Research Issues

There was strong support for case studies as a method for getting hard data on the effects of new technology on office work and women. Toward that

consensus, several framework questions were raised as points for consideration by researchers.

--What is a case?
--What are the questions to consider in conducting a case study?
--What evidence would be needed?
--What is the audience?
--What are the resource questions?
--Can the researcher get access to the case site?

It was noted that the assumptions one might have about what questions to ask would probably drive the shape of the case and ultimately its conclusions. Assumptions about the audience also impact on the shape of the case.

In considering what topics might properly be for casework rather than pursued by a survey or other vehicle, the following issues were identified as areas for case studies.

o Quality of jobs, including invisible work and invisible requirements in job descriptions where invisible refers to something that is either tacit, unaccounted for, or possibly unremunerated; and the causes of job loss and ways of averting it.

o Career ladders, tracing individuals through the different types of functions and positions they might hold. What kinds of jobs are created along the way as new technologies are adopted? Does technology homogenize skill requirements to make people more interchangeable? How does that phenomenon or process interact with training, and can training be used to shape what happens to skill requirements? How do the skill changes borne of technology relate to growing roles of temporary workers, for example?

o Organizational issues, showing differences according to size of the office, type of industry, type of product, extent to which employees are involved in decisionmaking, and the role that technology plays in mediating the various changes within the organization.

o Equal Opportunity, looking at office automation as a system and as a process changing an organization, and seeing over time which employees advance, noting differences, if any, by race, age, sex, and classification. In the area of classification, the concern is the dichotomy between exempt workers and nonexempt workers: if the worker is exempt the interest may be in protections; if the worker is nonexempt the interest may be in opportunities for promotion.

Other topics suggested for case studies include:

o Electronic monitoring of workers
o Offshore work
o Worker involvement in the implication or application of new technologies

o Return on investments of training, equipment, etc. (a larger issue than "productivity").

Workshop III. Identifying Issues for Experimental Programs

Suggestions for demonstration programs considered the importance of the following factors:

--involving clerical workers or end users in the planning and design of office automation;

--recognizing and building on the invisible skills of clerical workers;

--introducing office automation in such a way as to develop and enhance career opportunities;

--building in training and retraining options;

--taking cognizance of women's needs for day care;

--redesigning and reorganizing jobs so that they are enriched rather than impoverished or deskilled;

--increasing pay rather than decreasing it from its already low levels;

--breaking down racial and gender segregation in internal occupational classifications.

Concepts, including their rationale, were offered by participants for five experimental programs.

o Involve clerical workers in the design, use, and evaluation of software. The project would examine the kinds of skills that clerical workers use and would develop them still further. It would be related to job redesign and would also entail a close examination of how information is transmitted among and between people directly and through software. A critical part of this project would be an evaluation of this project based on two sets of criteria--job satisfaction on the part of clerical workers and productivity on the part of employers.

o Conduct a comparative experiment to introduce office automation in two different ways of teaching. One way would be more or less standard, with a professional trainer; the other would be with trained peer role models, that is, women clerical workers who have already gone through the process. They would train people who are not familiar with the new technology and would do so in great depth, enabling the trainees to take apart their machines and understand their innermost workings.

o Set up an automated office operation that is owned and controlled in a democratic fashion by its employees. It would sell the services of how to automate offices in a constructive way--how to build, create, generate, and sell information services, including software. An integral part of such a demonstration project would be to espouse a set of work values different from the prevailing ones, and it would incorporate flexible ways of working and innovative ways of solving technological problems. It also would teach business skills to self-employed women.

(It was pointed out in the workshop that similar projects exist that are called service bureaus; and they are created by people who quit being word processors and started their own word processing business and consulting firms.)

o Develop a process for addressing the needs of women for complete and accurate information about office automation. This project would prepare women to seek implementation of office automation in a way that is beneficial to them.

o Create a successful practices file where funded demonstration projects, as well as nonfunded ones, and related information would be compiled, computerized, analyzed, and shared. There would be subfiles as well that deal with specific issues such as worker ownership or child care. There also would be a referral agency so that potential clients could find cases that might be applicable to them and could contact the sources directly. (It was suggested that the Women's Bureau carry out this project.)

Comments

--Any project that might be considered a demonstration model should start with a core--have as a prerequisite a core of women who have expressed dissatisfaction with their current circumstances and have made a commitment to involve themselves in developing alternatives.

--Women have many roles and responsibilities. The kinds of demonstration projects and changes which might be useful at the workplace need to be sensitive to women's other responsibilities.

--There are philosophical issues which resolve around values. The possible divergence and convergence of the interests and needs of women clerical workers on the one hand and management on the other is a concern.

OTHER RESEARCH IDEAS

A number of ideas for a research agenda were shared by participants in the "Roundtable" and group discussion. Those suggestions are summarized here in terms of the research objectives expressed.

Employment Prospects

o To acquire data on the speed with which computers are spreading, how the equipment is being used, and in which occupations it is being used.

o To develop processes to reduce the uncertainty in projections of technological change and its impact on employment, using a more diverse approach to research which looks at vendors of equipment as well as user organizations.

o To answer such questions as: What kinds of jobs and how many are created or destroyed by office automation? Does automation affect the employment prospects of workers differently, by race, age, other factors?

o To gather empirical data on the export of clerical work to other countries.

Comment: Corporations spend millions of dollars in market research and studies to be more certain about the future, but who is investing the effort needed to reduce uncertainties in the interest of the worker?

Pay Equity and Career Opportunity

o To help understand the intersections between pay equity and office automation. Studies would identify more carefully the technological level of the company and of the programs being undertaken, and would provide insight into the seemingly contradictory research where some studies find deskilling of clerical work and others find upgrading, or where some describe a pattern of upskilling but downwaging.

o To determine how the organizational setting and conditions of work affect skills and career mobility of workers, that is, whether the scope of training and the freedom and time workers have to develop skills on new systems relate closely to career mobility.

o To examine problems caused by the distance between the designers of systems and the people involved with the content of work, such as the people in word processing pools.

o To identify and analyze company practices in various settings that contribute to a skills gap or polarization--what the job structure is in a given company versus what it is for the office work force as a whole. Also, to identify company practices that provide positive models to keep opportunities open.

o To develop user/worker designed and influenced studies which ask such questions as: What skills did you use before your job was changed by new technology and were they recognized and rewarded by your employer? which of those faded away and which carried over? and which of the new skills as well as the carryover skills are recognized and rewarded by your

employer? What do you think is important about your job? How do you think the company is mismanaging your area of work?

Comment: To tap the individual experiences of clerical workers, both case study research and longer range research are needed.

Job Satisfaction

o To answer such questions as: How is job satisfaction or success defined in terms of skills needed to be successful in word processing? What is the relationship between satisfaction in a word processing job and length of employment, or the time between the implementation of word processing and that particular study? How do people adapt to technology at different stages of the implementation process?

o To examine workers' personalities and work environmental factors concurrently, in order to clarify the relationship between the two.

o To look at the interaction between work environment, implementation models, and worker personality characteristics.

Equal Opportunity/Training

o To determine what are the effects, if any, of technology on older women clerical workers. To what extent are they not gaining equal access to training opportunities?

o To answer such questions as: What impact is new technology having on black women workers who have made an upgrade to clerical work? Is training helping them to keep pace or will those jobs be taken away as certain clerical workers become lower management? What is needed to develop more effective training programs?

o To determine any changes in the supervision of jobs. What types of measures are coming out of technology? What are some of the value systems that are designed into technology that permit it to have capability for electronic monitoring and excessive measuring?

o To explore the issue of labeling office workers who use technological equipment--why not call them skilled machine operators?

o To look at the transformation of white-collar work in general in the office place and how the entire functions are being distributed.

Comments: Research on the quality of jobs should tie in career ladders and racial nondiscrimination policies with what companies have to gain in terms of their current investment and productivity.

New ways must be found to link equal opportunity in the workplace with issues of access to and discrimination in education, particularly in higher education, because of both the sharp rise in the threshold of skills demanded from people entering new jobs and the increasing tendency of firms to hire trained personnel directly from the external labor market.

Home-Based Work

o To answer such questions as: Who is working at home and under what conditions? How do they feel about it in terms of their own psychology? (Micro-level research) How vulnerable is this group in terms of pay and other working conditions? (Macro-level research)

o To determine what are the benefits plans for women working at home on automated equipment--will they be disadvantaged at retirement age?

o To examine the effects on women of performing clerical work at home, to determine how to best protect the worker in the home under a variety of conditions, and to create other alternatives so that women's choices are less constrained than they are now.

APPENDIXES

Appendix A

CONFERENCE AGENDA

9:00 a.m. WELCOME TO THE ACADEMY

Dr. Roslyn Feldberg, Conference Chair
Panel on Technology and Women's Employment
Murray Research Center, Radcliffe College

OPENING REMARKS

Dr. Lenora Cole Alexander
Director
Women's Bureau

CONFERENCE GOALS AND OBJECTIVES

Dr. Mary Murphree, Conference Coordinator
Women's Bureau

9:15 a.m. ROUNDTABLE: DEFINING THE ISSUES

Employment Prospects
Carol Jusenius Romero
National Commission for Employment Policy

Quality of Jobs
Bonnie M. Johnson
INTEL Corporation

Pay Equity and Career Opportunity
Judith Gregory
Department for Professional Employees, AFL-CIO

Training and Retraining
Joyce Dudley
American Federation of State, County, and Municipal Employees

Employment Discrimination in Today's and Tomorrow's Economy
Thierry Noyelle
Columbia University

Working Conditions: Health, Safety, and Stress
Barbara Cohen
National Institute for Occupational Safety and Health

Women and Home-Based Work
Kathleen Christensen
Center for Human Environments
City University of New York, Graduate School

10:15 a.m. GROUP DISCUSSION

11:00 a.m. BREAK

11:15 a.m. INTRODUCTION OF KEYNOTE SPEAKER

Clinton M. Wright
Deputy Director
Women's Bureau

Office Automation: A Brief History of Thought
Eleanor Wynn
Bell Northern Research

12:15 p.m. LUNCH

1:30-
3:45 p.m. SIMULTANEOUS WORKSHOPS

Workshop I: Macro-Level Research on Clerical Employment Issues
(Potential job loss; changes in occupational structures, compensation and working conditions; and data needs)

Facilitators: Russell Rumberger, Standford University
Roberta McKay, Women's Bureau

Rapporteur: Timothy Hunt, W.E. Upjohn Institute for Employment Research

Workshop II: Micro-Level Research on Clerical Work
(Implementing change in organizations, shifting work roles; case study methodology)

Facilitators: Robert Yin and Gwendolyn Moore, Cosmos Corporation

Mary Murphree, Women's Bureau

Rapporteur: Marjorie Blumenthal, Office of Technology Assessment

Workshop III: Identifying Issues for Experimental Programs (Successful Women's Bureau demonstration projects; models for office automation)

Facilitators: Michael Baker, The Educational Fund for Individual Rights
Gwendolyn Wong, Women's Bureau

Presentation: John Beverly, Women's Bureau

Rapporteur: Karen Sacks, Business and Professional Women's Foundation

4:00 p.m. WORKSHOP REPORTS AND RECOMMENDATIONS

5:30 p.m. RECEPTION

CONFERENCE PLANNING GROUP

Advisors and Staff

Panel on Technology and Women's Employment, National Research Council/ National Academy of Sciences, Members: Heidi Hartmann (Study Director), Roslyn Feldberg, Tamar Bermann, Robert Kraut, Louise Tilly.

Women's Bureau, U.S. Department of Labor: Roberta McKay, Collis Phillips, Clinton Wright

Women's Bureau, U.S. Department of Labor, Coordinators: Charity Goodman and Mary Murphree; Assistant: Linda Groff.

Panel on Technology and Women's Employment, National Research Council/ National Academy of Sciences, Coordinator: Lucile DiGirolamo; Assistant: Katherine Autin.

Appendix B

LIST OF PARTICIPANTS

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